APPENDIX A

Surface Topography

1 SURFACE TOPOGRAPHIC DATA

This Appendix describes the land elevation data that were available for the project as well as the processing that was done in order to develop surface topographic data for the ISGM.

1.1 Available Data and Data Processing

The basis topographic data set consists of 5 feet contour USGS quad sheets covering South Florida Water Management District (SFWMD), South West Florida Water Management District (SWFMD) and Saint Johns River Water Management District (SJRWMD).

In order to interpolate the 5 feet contour data into a grid the three USGS quad sheets were merged into 1 file. Subsequently the contour data were interpolated into a 1000 ft square grid system.

In connection with the initial model simulations it became clear that the basic USGS 5 feet contour maps were not sufficiently detailed to represent the land elevation at the monitoring wells used in the model calibration. For many of the calibration wells the interpolated grid values, based on the USGS quad sheets only, were 1-2 feet off. This uncertainty at calibration wells is unacceptable as the calibration targets on groundwater tables in the primary focus area were defined to 1 foot. If for instance the land elevation at a specific monitoring well is 2 feet too low, the simulated groundwater table may be affected accordingly.

In order to improve the precision of the land elevation data, in particular at the wells used for the model calibration, the USGS quad sheets were supplemented by spot elevation data collected in connection with establishment of geologic boreholes and monitoring wells. The spot elevation data are described below.

USGS Boreholes

For all USGS boreholes in Orange and Osceola counties the land elevations were extracted from the well construction data. The well construction data files, however, contained several megabytes of construction data in a very unhandy ASCII file format. In order to extract relevant information, for instance land elevation data, a small utility program was developed (wells.exe) that reads the USGS well construction data files and extracts information as requested by the user and writes a tab-separated output data file that goes directly into EXCEL. Well co-ordinates in the USGS wells were given only as geographic co-ordinates (NAD83) and thus had be converted to the model co-ordinate system (State Plane, NAD83, Florida East-0901, US Survey Feet). The co-ordinate conversion was done by exporting the well construction data from Excel to a comma delimited text file (CVS file). The CVS file with the format x,y,z were then imported to CORPSCON (see Table 1) for co-ordinate conversion. The CVS output file were finally imported to ArcView and converted to a shp point-theme file with topographic elevation for each USGS well.

SFWMD Land Elevation Data

In addition land elevation data was available for a number of SFWMD monitoring wells located around Lake Toho and Lake Alligator. Excel spreadsheet files were developed with well-id, x- and y co-ordinate and land elevation and subsequently imported into ArcView and converted to a point shp-file. Finally detailed land elevations were available for the Big Bend transsect located East of Brick lake.

Figure 1 illustrates the raw land elevation data described above and Figure 2 shows the interpolated data on a 1000 feet grid network. The interpolation was done using an inverse-distance-weighted interpolation included in MIKE SHE's pre-processor.

All available land elevation data (raw and processed) are listed in Table 1 together with programs that were used to process and develop the model topography.

Surface topographic Data

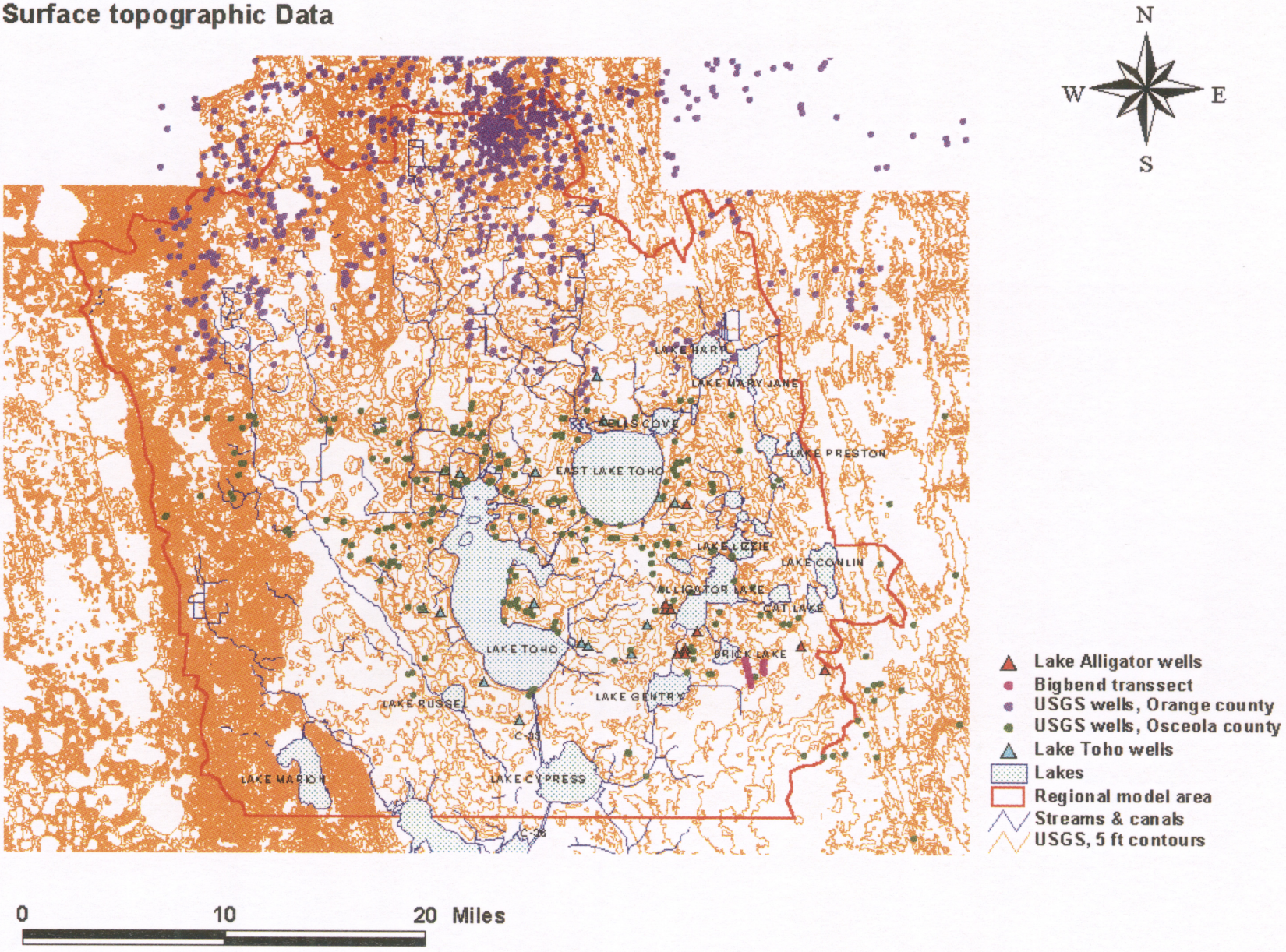

Figure 1 Topographic Data sets used in the model

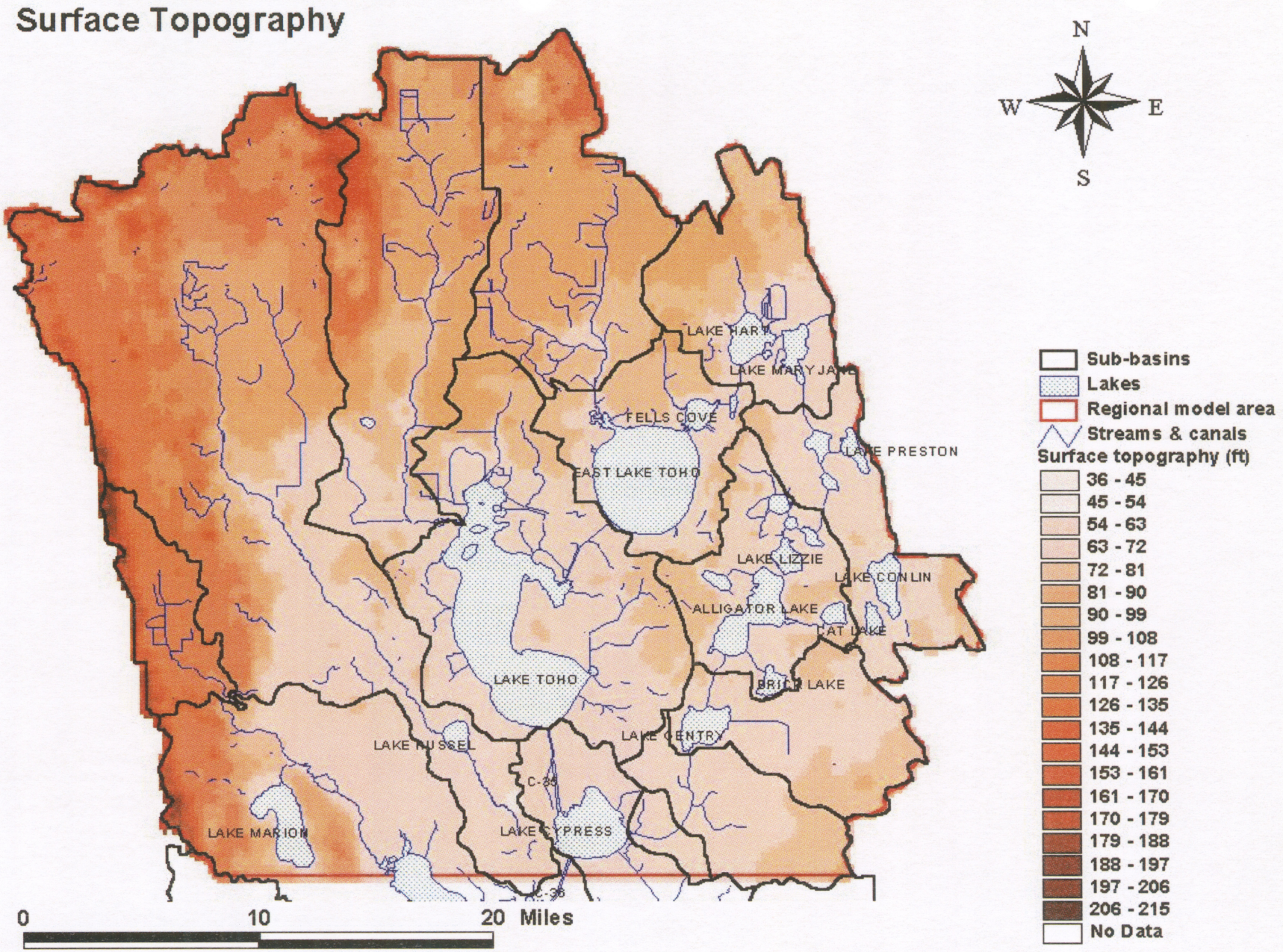

Figure 2 Surface Topography Interpolated into a 1000 ft square grid mesh

Table 1 List of Data Files and Utility Programs Used to Develop Model Topography

Description	Data File on Project CD-rom	Comments/file type
USGS 5 ft quad sheet covering SFWMD	GIS/Topo/Topo-sfwmd.shp	ArcView shp file
USGS 5 ft quad sheet covering SWFWMD	GIS/Topo/Topo-swfwmd.shp	ArcView shp file
USGS 5 ft quad sheet covering SJRWMD	GIS/Topo/Topo-sjrwmd.shp	ArcView shp file
USGS 5 ft quad sheet covering the 3 above WMD's	GIS/Topo/topo-01.shp	ArcView shp file
USGS well construction data for Orange county	Data/Geology/USGS_wellconst-orange.txt	ASCII file
USGS well construction data for Osceola county	Data/Geology/USGS_wellconst-osceola.txt	ASCII file
Land surface elevation (ft) for USGS wells in Orange county	GIS/Topo/Orange-wells-topo-new.shp	ArcView shp file. Data extracted from USGS well construction files using wells.exe. Co-ordinates transformed using Corpscon.
Land surface elevation (ft) for USGS wells in Osceola county	GIS/Topo/Osceola-wells-topo-new.shp	ArcView shp file.
Land surface elevation for the Big Bend transsect.	GIS/Topo/Bigbend-topo.shp	ArcView shp file
Land surface elevation (ft) for Lake Alligator wells.	GIS/Topo/wells-Alligator.shp	ArcView shp file.
Land surface elevation (ft) for Lake Toho wells.	GIS/Topo/Toho-new-wells-topo.shp	ArcView shp file.
Utility program that reorganises and extracts user specified information from USGS well construction data files.	She2000/bin/wells.exe	Developed by DHI for Lake Toho project (public domain)
Corpscon, v. 5.x for Windows	N/A	Public domain program for co-ordinate transformation developed by US Corps of Engineers.